# **ENVIRONMENTAL PRODUCT DECLARATION**

as per ISO 14025 and EN 15804

| Owner of the Declaration | Rudolf Hensel GmbH                   |
|--------------------------|--------------------------------------|
| Programme holder         | Institut Bauen und Umwelt e.V. (IBU) |
| Publisher                | Institut Bauen und Umwelt e.V. (IBU) |
| Declaration number       | EPD-RHG-20140204-IAA1-EN             |
| Issue date               | 12.12.2014                           |
| Valid to                 | 11.12.2019                           |

# HENSOMASTIK® 5 KS Rudolf Hensel GmbH



www.bau-umwelt.com / https://epd-online.com





## 1. General Information

### Rudolf Hensel GmbH

#### Programme holder

IBU - Institut Bauen und Umwelt e.V. Panoramastr. 1 10178 Berlin Germany

### Declaration number

EPD-RHG-20140204-IAA1-EN

# This Declaration is based on the Product Category Rules:

Coatings with organic binders, 07.2014 (PCR tested and approved by the SVR)

## Issue date

12.12.2014

Valid to 11.12.2019

Wiemanjes

Prof. Dr.-Ing. Horst J. Bossenmayer (President of Institut Bauen und Umwelt e.V.)

Mann

Dr. Burkhart Lehmann (Managing Director IBU)

# 2. Product

#### 2.1 Product description

HENSOMASTIK® 5 KS is an ablative, mediumviscosity and non-hygroscopic, water-based fire protection coating in the embodiments "paint", "viscous" and "filling". It is a factory-produced dispersion coating with organic binding agents, water, mineral fillers, pigments and additional substances. The coating is classified as low-emission, and contains no solvents, fibres, borates, plasticisers, halogens, formaldehydes or alkylphenol ethoxylates (APEO).

The fire protection coating is part of the "Green Product Line" of Rudolf Hensel GmbH.

#### 2.2 Application

The HENSOMASTIK® 5 KS ablation coating is a normally inflammable construction material in accordance with DIN 4102-1, classified for indoor and outdoor use.

The coating is suitable as fire protection for horizontally and vertically routed cables as well as for upgrading the cable supporting structure. In the event of approval in an individual case, use as a substitute for F30

### HENSOMASTIK<sup>®</sup> 5 KS

#### Owner of the Declaration

Rudolf Hensel GmbH Lack- und Farbenfabrik Lauenburger Landstraße 11 21039 Börnsen

#### Declared product / Declared unit

The declared product is HENSOMASTIK® 5 KS. The declared unit involves 1 kilogram of the product. The packaging is included in the calculation.

#### Scope:

This document refers to HENSOMASTIK® 5 KS. Specific data from the manufacturing plant of the company Rudolf Hensel GmbH in Börnsen was used for generating this LCA, which is based on data from 2012. This document is translated from the German Environmental Product Declaration into English. It is based on the German original version EPD-RHG-20140204-IAA1-DE. The verifier has no influence on the quality of the translation. The owner of the declaration shall be liable for the underlying information and evidence; the IBU shall not be liable with respect to manufacturer information, life cycle assessment data and evidences.

#### Verification



Dr.-Ing. Wolfram Trinius (Independent verifier appointed by SVR)

suspended ceilings or as a substitute for I30 installation ducts is possible.

In conjunction with building material class A mineral fibre material, HENSOMASTIK® 5 KS is processed to make flexible wall constructions. Bushings for all kinds of lines, combustible and non-combustible pipes as well as refrigeration pipes can be sealed. When installed in rigid or light partition walls and in ceilings, this system corresponds to the fire resistance classes El60 and El90 in accordance with EN 1366-3 and S90 in accordance with DIN 4102-9.

After HENSOMASTIK® 5 KS has dried completely and even with greater layer thicknesses, it is still highly elastic and resistant to ageing, water-impermeable following DIN 1048, oil and petrol-resistant, weatherproof and UV-resistant in accordance with DIN 53384.

#### 2.3 Technical Data

HENSOMASTIK® 5 KS contains no hazardous substances exceeding the limit values of Annex XVII of



REACH and the ECHA list of materials of particularly high concern.

#### **Technical construction Data**

| Name                                     | Value          | Unit                      |
|--|----------------|---------------------------|
| Density                                  | 1280 -<br>1420 | kg/m³                     |
| Solids content tested at 105°C for<br>3h | 65 - 80        | %                         |
| Limiting oxygen index (LOI)              | 37 - 48        | %                         |
| Flexibility                              | ≥6             | mm<br>mandrel<br>diameter |

HENSOMASTIK® 5 KS is an emission-rated coating material. Sampling, testing and evaluation were effected in accordance with the latest versions of AgBB, ISO 16000-3, ISO 16000-6, ISO 16000-9 and ISO 16000-11.

Germany: HENSOMASTIK® 5 KS meets the requirements of the "Approval guidelines for the health-related evaluation of indoor construction products" (DIBt publications 10/2010) in conjunction with the NIK values of the AgBB in the version dated June 2012.

France: CMR substances: The tested product meets the requirements of the French directives DEVP0908633A of 30 April 2009 and DEVP0910046A of 28 May 2009.

VOC classification: HENSOMASTIK® 5 KS was classified as VOC emission class A+. The recommendation for the classification is given on the basis of the French regulation for the marking of construction products or wall coverings, floor coverings, paints and varnishes with reference to the emissions of volatile pollutants, as published on 25 March 2011 (décret DEVL1101903D) and 13 April 2011 (arrêté DEVL1104875A).

Belgium: HENSOMASTIK® 5 KS meets the requirements of the Royal Decree for determining the limit values for indoor emissions by construction products for certain intended types of use (draft of December 2012).

**2.4 Placing on the market / Application rules** HENSOMASTIK® 5 KS in the embodiments "paint" and "viscous" has general building inspection approval and is externally monitored - Deutsches Institut für Bautechnik: General building inspection approval Z-19.11-1246

HENSOMASTIK® 5 KS in the embodiment "filling" has general building inspection approval and is externally monitored - Deutsches Institut für Bautechnik: General building inspection approval Z-19.11-1454

HENSOMASTIK® 5 KS is also approved by the American commercial industrial insurance company FM Global (Approval Report ID No. 3018997) and

meets the requirements of IEC 60332-3, category A certified by

- Germanischer Lloyd (Certificate No. 13748-99 HH)

- American Bureau of Shipping (Certificate No. 03-HG 367672-2-PDA)

- Det Norske Veritas (Certificate No. E-12933)

In the sealing application, HENSOTHERM® 5 KS is approved as follows:

- in accordance with DIN 4102-9 (S90)

- in accordance with EN 1366-3: European Technical Approval ETA-12/0214 (EI90), ETA-11/0209 (EI60)

### 2.5 Delivery status

HENSOMASTIK® 5 KS is a medium-viscosity coating material and is offered in plastic containers of different sizes from 6 - 25 kg.

#### 2.6 Base materials / Ancillary materials

| Name                   | Value   | Unit    |
|------------------------|---------|---------|
| Polymer dispersion 50% | 45 - 60 | % [m/m] |
| Aluminum hydroxides    | 20 - 40 | % [m/m] |
| Pigment TiO2           | < 5     | % [m/m] |
| Silicate fibre         | < 5     | % [m/m] |
| Dispersing agents      | < 1     | % [m/m] |
| Thixotropic agents     | < 1     | % [m/m] |
| In-can preservatives   | < 1     | % [m/m] |
| Water                  | < 5     | % [m/m] |

The in-can preservative contained in the product comes from the group of isothiazolinones.

#### 2.7 Manufacture

The manufacture of HENSOMASTIK® 5 KS is effected in a fully automatically controlled dispersion unit. The dosing of the liquid raw materials is effected largely automatically, powders are dosed manually. The preliminary products required for manufacture are made available after an inspection of the incoming materials.

After the batches have been produced, an internal quality control is carried out. This comprises technical quality characteristics relating to paint and fire protection requirements.

Besides the internal factory production control, official external monitoring takes place at regular intervals.

# 2.8 Environment and health during manufacturing

The preliminary products are stored in such a way that, as far as humanly possible, they cannot enter the environment.

With raw materials that are dosed automatically, direct contact between the workers and the preliminary products is avoided. When raw materials in powder form are dosed manually, direct contact with the raw material is reduced to a minimum. As well as adequately dimensioned extraction units, the workers have protective clothing and dust masks at their disposal. Suitable body protection equipment is also provided.

The production process is optimised in such a way that the parts of the unit can be cleaned in situ. Any cleaning water is fed back into the production process as production water. If this should not be possible on



account of a product change, the cleaning water is collected and thermally recycled.

All types of waste are sorted, stored and returned to the recycling process.

HENSOMASTIK® 5 KS contains no substances that have to be declared in accordance with REACH (Annex XVII) and in accordance with the ECHA list of materials.

#### 2.9 Product processing/Installation

The product can be applied using brushes, rollers or sprays.

Details concerning surface pre-treatment, application requirements and drying behaviour can be seen in the current technical information sheet. (see www.rudolf-hensel.de)

#### 2.10 Packaging

The coating is filled in plastic containers made of polypropylene (PP), which are recycled by the customers returning the packaging. The plastic containers are packed on pallets for shipping and are protected with a shrink foil made of low-density polyethylene (LPDE).

#### 2.11 Condition of use

This is an ablative fire protection coating on an aqueous polymer dispersion basis for protecting electric cables and cable routes. After the coating has been applied, the film is formed by physical drying – through evaporation of the receptively contained water. The dried polymer film, including the non-aqueous substances, remains on the coated component.

#### 2.12 Environment and health during use

HENSOMASTIK® 5 KS is a coating with extremely low emissions and is not considered to pose a health risk. Emission tests – performed in independent laboratories – have confirmed that the requirements of various national and international emissions standards are met, with classification in the lowest emission class (see Section 7).

The coating contains no solvents, fibres, borates, plasticisers, halogens, formaldehydes or alkylphenol ethoxylates (APEO).

#### 2.13 Reference service life

For HENSOMASTIK® 5 KS, when used for the intended purpose, the service life is at least 10 years - Test Certificate MPA Braunschweig - Document Number (3623/1599) - 7/09 - Mü)

HENSOMASTIK® 5 KS has been used as a fire protection coating for electric cables, cable trays or - ladders and flexible wall constructions since 1986, so that the practical service life is normally far longer than 10 years.

A precondition for a long service life is that the requirements of correct handling and regular inspection of the coated substrates are satisfied.

The information concerning service life cannot be interpreted as a guarantee given by the manufacturer, but serves as an aid towards the selection of the right product, taking account of the expected and economically reasonable service life of the building. When the product is used according to the standard codes of practice, adverse influences through ageing are not known.

#### 2.14 Extraordinary effects

#### Fire

Ablative fire protection coatings contain components (including flame retardants) which decompose while absorbing energy. On account of this decomposition, these coatings consume energy, thus protecting the substrate from fire as well as the environment of the fire, thanks to this cooling mechanism. When the decomposition temperature of the active components is reached, the fire protection effect begins spontaneously and continues until decomposition is fully completed.

#### **Fire protection**

| Name   | Value |
|--|-------|
| Building material class according to /FN13051-1/ | E     |

#### Water

No substances hazardous to water are washed out.

#### **Mechanical destruction**

No consequences for the environment caused by unforeseen mechanical destruction are known.

#### 2.15 Re-use phase

On account of its share of organic products, HENSOMASTIK® 5 KS has a substance-inherent energy content, which can be recovered in incineration plants. On account of the thermoplastic properties of the fire protection coating, the latter can be softened with a hairdryer and then mechanically removed with a scraper.

If the fire protection coating is to be deposited separately, it meets the required standards for disposal.

#### 2.16 Disposal

The following waste code numbers must be taken into account:

a) Solid product residues;

AVV No. (recommended): 080118 Waste from paint and varnish removal with the exception of that covered by 08 0117.

b) Liquid product residues:

AVV No. (recommended): 080120 Aqueous suspensions containing paint and varnish with the exception of those covered by 080119.

Packaging that cannot be cleaned is to be disposed of like the substance. Uncontaminated packaging can be recycled.

AVV No. (recommended): 1501025 Packaging made of plastic.

#### 2.17 Further information

Further product information is available at: www.rudolf-hensel.de



### 3. LCA: Calculation rules

#### 3.1 Declared Unit

The declared unit is a fire resistant by Rudolf Hensel GmbH with the designation HENSOMASTIK® 5 KS, with packaging. The weight refers to one kilogram of the fire retardant. The following table depicts the data on the declared unit.

#### **Declared unit**

| Name          | Value | Unit |
|---------------|-------|------|
| Declared unit | 1     | kg   |

#### 3.2 System boundary

Type of EPD: cradle to plant gate The following information modules are defined in this study as system boundaries:

A1- A3 Product stage:

- A1, Raw material supply
- A2, Transport to manufacturer
- A3, Production

A total of three information modules are reviewed in order to obtain an accurate record of the indicators and environmental impact of the declared unit. Information modules A1 to A3 outline the provision of raw materials, transport to the production facility and the actual product production processes.

All preliminary products are procured mainly in Germany. Transport is exclusively by truck. The following process diagram depicts the production process on which this is based.



Fig.: Flow chart of the production process

#### 3.3 Estimates and assumptions

In order to calculate the material provision of the titanium oxide, a titanium oxide dataset is used, since there is no dataset for titanium oxide in the databases used.

This is also applicable for the formula contents silicate fibres and vinyl acetate copolymer (50% aqueous), which are shown by the datasets glass fibres and ethylene vinyl acetate copolymer. No assumptions or restrictions were made for further formula contents.

Since the transportation routes are mainly within Germany, a German mixture was used as a basis for the provision of the fuel.

#### 3.4 Cut-off criteria

All of the information modules taken into consideration were included in the calculation in such detail that all requirements of EN 15804 were satisfied.

#### 3.5 Background data

The data basis of the background data of the GaBi 6.0 databases to which this study also refers is documented under the following link GaBi 6.0 Software.

#### 3.6 Data quality

The background data sets used are no more than 10 years old. The life cycle inventory data of the manufacturer are from the year 2012 and correspond to the annual average. The technical background of the study corresponds to physical reality. Generic data are selected and used in accordance with CEN/TR 15941. The plausibility of the generic data is warranted.

#### 3.7 Period under review

Data from 2012 are used as a basis.

#### 3.8 Allocation

A co-product allocation (closed loop) takes place in the A3 information module under review. For the waste output flow to the thermal recovery unit, electrical energy credits can be obtained in a waste incineration plant through the incineration. These are offset against the energy requirements of the German power mix within the A3 information module in a closed loop.

#### 3.9 Comparability

Basically, a comparison or an evaluation of EPD data is only possible if all the data sets to be compared were created according to /EN 15804/ and the building context, respectively the product-specific characteristics of performance, are taken into account.

## 4. LCA: Scenarios and additional technical information



## 5. LCA: Results

| DESC  | ESCRIPTION OF THE SYSTEM BOUNDARY (X = INCLUDED IN LCA; |               |                                     | LCA;                   | MND = MODULE NOT DECLARED) |                         |          |  |   |                           |                          |                               |           |                  |          |  |
|---|---|---------------|-------------------------------------|------------------------|----------------------------|-------------------------|----------|--|---|---------------------------|--------------------------|-------------------------------|-----------|------------------|----------|--|
| PRODUCT STAGE CONSTRUCTI<br>ON PROCESS USE STAGE<br>STAGE |   |               |                                     |                        |                            | END OF LIFE STAGE       |          |  | BENEFITS AND<br>LOADS<br>BEYOND THE<br>SYSTEM<br>BOUNDARIES |                           |                          |                               |           |                  |          |  |
| Raw material<br>supply                                    | Transport   | Manufacturing | Transport from the gate to the site | Assembly               | Use                        | Maintenance             | Repair   | Replacement  | Refurbishment   | Operational energy<br>use | Operational water<br>use | De-construction<br>demolition | Transport | Waste processing | Disposal | Reuse-<br>Recovery-<br>Recycling-<br>potential |
| A1  | A2  | A3            | A4                                  | A5                     | B1                         | B2                      | B3       | B4   | B5  | B6                        | B7                       | C1                            | C2        | C3               | C4       | D  |
| X   | Х   | Х             | MND                                 | MND                    | MND                        | MND                     | MND      | MND  | MND   | MND                       | MND                      | MND                           | MND       | MND              | MND      | MND  |
| RESU  | ILTS  | OF TH         | IE LCA                              | - EN'                  | VIRON                      | MENT                    | AL IN    | PACT   | : HEN   | SOMA                      | STIK®                    | 5 KS                          | [kg]      |                  |          | •  |
|   |   |               | Param                               | eter                   |                            |                         |          | Unit   |   |                           |                          |                               | A1-A      | 3                |          |  |
|   |   | Glob          | oal warmii                          | ng potent              | ial                        |                         | [ŀ       | g CO <sub>2</sub> -Eq                                      | l.]   |                           |                          |                               | 1.14      |                  |          |  |
|   | Depletio  | n potenti     | al of the s                         | tratosphe              | ric ozone                  | layer                   | [kg      | kg CFC11-Eq.] 6.20E-8                                      |   |                           |                          |                               |           |                  |          |  |
|   | AC  | Fut           | rophicatio                          | n potentia             | nu water<br>al             |                         | [f       | <u>Iry 3∪2-⊏y-j</u><br>kg (PO₄) <sup>3</sup> -Eg.] 4.72E-3 |   |                           |                          |                               |           |                  |          |  |
| Formati   | on poter  | ntial of tro  | pospheric                           | c ozone p              | hotochem                   | nical oxida             | ants [kg | g ethene-Eq.] 8.36E-4                                      |   |                           |                          |                               |           |                  |          |  |
|   | Abiotic   | depletion     | potential                           | for non-fo             | ossil resou                | irces                   | [        | [kg Sb-Eq.] 7.98E-6  |   |                           |                          |                               |           |                  |          |  |
|   | Abiot   | ic depleti    | on potenti                          | al for foss            | sil resourc                | es                      |          | [MJ]   |   |                           |                          |                               | 30.03     | 6                |          |  |
| RESU  | LTS   | OF TH         | IE LCA                              | 4 - RE                 | SOUR                       | CE US                   | E: HE    | NSOM   | ASTIN   | (® 5 K                    | S [kg]                   |                               |           |                  |          |  |
|   |   |               | Para                                | neter                  |                            |                         |          | Unit   |   | A1-A3                     |                          |                               |           |                  |          |  |
|   | Ren   | ewable p      | primary er                          | nergy as e             | energy ca                  | rier                    | ~        | [MJ]   | 0.62  |                           |                          |                               |           |                  |          |  |
| Re  | Total   | se of rer     | energy re                           | rimany er              | as materia                 | ai uuiizauo<br>iurces   | 1        |  | 0.00  |                           |                          |                               |           |                  |          |  |
|   | Non-re  | enewable      | e primary                           | energy as              | s energy (                 | arrier                  |          | [MJ]   | 20.91   |                           |                          |                               |           |                  |          |  |
|   | Non-rer   | ewable p      | primary er                          | nergy as r             | naterial ut                | ilization               |          | [MJ]   | 9.12  |                           |                          |                               |           |                  |          |  |
|   | Total use   | e of non-r    | renewable                           | e primary              | energy re                  | sources                 |          | [MJ]   | 30.03   |                           |                          |                               |           |                  |          |  |
|   |   | Use           | e of secon                          | idary mat              | erial                      |                         |          | [kg]   | 0.00  |                           |                          |                               |           |                  |          |  |
|   | 1   | Use of no     | renewable                           | e seconda<br>ble secor | ary tuels                  |                         |          |  | U] 0.56E-5  |                           |                          |                               |           |                  |          |  |
| Use of not fresh water                                    |   |               |                                     |                        | [m <sup>3</sup> ]          | <u>기</u> 0.49도~4<br>키 _ |          |  |   |                           |                          |                               |           |                  |          |  |
| RESU  |   | OF TH         | IE LCA                              | A - OU                 | TPUT                       | FLOW                    | /S AN    | D WAS  | STE C   | ATEG                      | ORIES                    | :                             |           |                  |          |  |
| HENS  | OMA   | STIK          | 0 5 KS                              | [ka]                   |                            |                         |          |  |   |                           |                          |                               |           |                  |          |  |
| Parameter   |   |               |                                     |                        | Unit                       | A1-A3                   |          |  |   |                           |                          |                               |           |                  |          |  |
| Hazardous waste disposed                                  |   |               |                                     |                        | [kg]                       | -                       |          |  |   |                           |                          |                               |           |                  |          |  |
| Non-hazardous waste disposed                              |   |               |                                     |                        | [kg]                       | 0.55                    |          |  |   |                           |                          |                               |           |                  |          |  |
| Radioactive waste disposed                                |   |               |                                     |                        | [kg]                       | 1.32E-4                 |          |  |   |                           |                          |                               |           |                  |          |  |
| Components for re-use                                     |   |               |                                     |                        | [kg]                       | 0.00                    |          |  |   |                           |                          |                               |           |                  |          |  |
| Inviaterials for energy recovery                          |   |               |                                     |                        | [kg]                       |                         |          |  |   | 0.00                      |                          |                               |           |                  |          |  |
| Exported electrical energy                                |   |               |                                     |                        | [MJ]                       | 0.00                    |          |  |   |                           |                          |                               |           |                  |          |  |
| Exported thermal energy                                   |   |               |                                     |                        | [MJ]                       |                         |          |  |   | 0.00                      |                          |                               |           |                  |          |  |

All indicators are recorded in accordance with EN 15804. The impact of environmental loads is estimated in accordance with CML 2001.

The Hazardous waste for landfilling (HWD) and Use of fresh water (FW) indicators are not recorded in the background data on account of this information not being available. The decision by the SVR of 07.01.2013 allows for this.

# 6. LCA: Interpretation

The dominance analysis shows that the main cause of the environmental impacts and indicators can be found in information module A1. This shows a global warming potential for material provision of approx. 90% with reference to all information modules. If we look at the material provision for the fire retardant HENSOMASTIK® 5 KS in detail, it becomes clear that three raw materials make a decisive contribution to the environmental impacts and indicators in question. The material provision of the vinyl acetate copolymer accounts for approx. 65% of the GWP. With titanium oxide this figure is about 22% and with the silicate fibres it is about 12% of the greenhouse gas emissions. The other environmental impacts and indicators are analogous to these figures.





The mass of the vinyl acetate copolymer, titanium oxide and silicate fibres come from the information on the formula. According to the manufacturer, it can be assumed that the accuracy of this information is high. This also results in adequate quality of the LCA results. The relevant datasets that were used to calculate the material provision of the fire retardant HENSOMASTIK® 5 KS are absolutely up to date.

### 7. Requisite evidence

#### 7.1 VOC emissions

For products used in indoor applications. At least the following must be declared: Test method in accordance with the AgBB scheme indicating the measuring agency, date and results as a range of values.

#### **VOC** emissions

| Name                          | Value | Unit  |
|-------------------------------|-------|-------|
| Overview of Results (28 days) | <5    | µg/m³ |
| TVOC (C6 - C16)               | <5    | µg/m³ |
| Sum SVOC (C16 - C22)          | <5    | µg/m³ |
| R (dimensionless)             | <1    | -     |
| VOC without NIK               | <5    | µg/m³ |
| Carcinogenic Substances       | <1    | µg/m³ |

Test reports by Eurofins Product Testing A/S

HENSOMASTIK® 5 KS: Report No. 392-2013-00015802 of 26.07.2013.

The emission values were determined immediately after the application of the coating materials.

## 8. References

#### Institut Bauen und Umwelt

Institut Bauen und Umwelt e.V., Berlin(pub.): Generation of Environmental Product Declarations (EPDs); HENSOMASTIK® 5 KS meets the requirements relating to a low VOC content in accordance with LEED.

HENSOMASTIK® 5 KS is registered with the Deutsche Gesellschaft für Nachhaltiges Bauen (DGNB - German Association for Sustainable Building).

Registration code: CDDWRA

#### General principles for the EPD range of Institut Bauen und Umwelt e.V. (IBU), 2013/04 www.bau-umwelt.de

ISO 14025



DIN EN ISO 14025:2011-10: Environmental labels and declarations — Type III environmental declarations — Principles and procedures

#### EN 15804

EN 15804:2012-04+A1 2013: Sustainability of construction works — Environmental Product Declarations — Core rules for the product category of construction products

# Product Category Rules for Construction Products, Part A:

Calculation rules for the Life Cycle Assessment and requirements on the Background Report, 2013-04

# Product Category Rules for Building Products, Part B

Coatings with organic binding agents, 07-2012

#### ISO 14044

DIN EN ISO 14044:2006-10: Environmental management - Life cycle assessment - Requirements and guidelines

GaBi 6.0 software for comprehensive analysis

http://documentation.gabi-software.com/ (01.10.2014)

### ecoinvent v. 2.2

http://www.ecoinvent.org (01.10.2014)

## ELCD II – European Life Cycle Database

http://epica.jrc.ec.europa.eu/ (01.10.2014)

### CML 2001 Nov. 2010

Environmental impact indicators http://cml.leiden.edu/software/datacmlia.html/downloads (01.10.2014)

#### CEN/TR 15941

CEN/TR 15941:2010-03: Sustainability of construction works – Environmental Product Declarations - Methods for selecting and using generic data; German version CEN/TR 15941:2010

## REACH Directive (EC/1907/2006) Annex XVII -

Restrictions Official Gazette No. L 396/396-851 of 30.12.2006

# ECHA (European Chemical Agency) - list of materials:

**Candidate List of Substances of Very High Concern** for Authorization (published in accordance with Article 59(10) of the REACH Regulation)

**DIN 4102-1** Fire behaviour of building materials and building components; Building materials, concepts, requirements and tests (Issue May 1998)

**DIN 1048-1** Testing concrete; testing of fresh concrete, hardened concrete in specially produced test samples

**EN 13501-1:2010** Classification of construction products and methods by fire performance – Part 1: Classification with the results of tests on reaction to fire of construction products

**ISO 11890-2:2013** Paints and varnishes --Determination of volatile organic compound (VOC) content -- Part 2: Gas-chromatographic method

**ISO 16000-3:2011** Indoor air - Part 3: Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air - Active sampling method

**ISO 16000-6:2011** Indoor air - Part 6: Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA sorbent, thermal desorption and gas chromatography using MS or MSFID

**ISO 16000-9: 2006** Indoor air - Part 9: Determination of the emission of volatile organic compounds from building products and furnishing - Emission test chamber method

**ISO 16000-11:2006** Indoor air - Part 11: Determination of the emission of volatile organic compounds from building products and furnishing - Sampling, storage of samples and preparation of test specimens

#### AgBB: German Committee for Health-Related

**Evaluation of Construction Products** (AgBB) Evaluation scheme developed for VOC emissions from indoor-relevant construction products (2012)

# Approval guidelines for Health-Related Evaluation of Indoor Construction Products

(DIBt publications 10/2010) in conjunction with the NIK values of the AgBB in the version dated June 2012.

French directive DEVP0908633A of 30 April 2009

French directive DEVP0910046A of 28 May 2009

#### KINGDOM OF BELGIUM - Federal Public Service Health, Safety of the FOOD CHAIN AND ENVIRONMENT: Royal Decree for determining the limit values for indoor emissions by construction products for certain intended types of use (draft of December 2012)

**DIN 4102-9:1990-05** Fire behaviour of building materials and building components; cable penetration seals; concepts, requirements and tests

**DIN EN 1366-3:2009-07** Fire resistance tests for service installations - Part 3: Penetration seals; German version EN 1366-3:2009

Test Certificate MPA Braunschweig - Document Number (3623/1599) - 7/09 - Mü)

IEC publication 332-3: 1982

**LEED (Leadership in Energy and Environmental Design)**: LEED credit EQ c4.2 – Low Emitting Materials – Paint and Coatings (2009)

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